TRANSMITTAL SLIP DATE 6 Aug. 82

TO: NIO / Economics

ROOM NO. 7E62 | BUILDING HQS

REMARKS:

FROM: SOVA / SED

STAT

SECRET [redacted] 25X1

6491-82

5 August 1982

MEMORANDUM FOR THE RECORD

SUBJECT: Prospects for Delaying the Soviet Union's Natural Gas Export Project

The attached was submitted in response to a request from Henry Rowen, Chairman, NIC, for a briefing paper for the IG Meeting of 2 August and the SIG Meeting of 3 August on the subject of pipeline sanctions. It was transmitted to Harvey Shapiro, Office of East-West Economic Policy, Treasury Department, for use by Secretary Regan. The material, which was prepared by [redacted] 25X1 [redacted] and the undersigned, was also sent to Under 25X1 Secretary of State James Buckley for the IG and SIG meetings as well as for use in connection with scheduled Congressional testimony on the President's sanctions program on 3 and 4 August.

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Soviet Economy Division, SOVA

Attachment: a/s

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PROSPECTS FOR THE SOVIET NATURAL GAS EXPORT PROJECT

ISSUES AND ANSWERS

An examination of the impact of US sanctions on the Soviet Union's gas export pipeline and the Soviet economy must address four separable issues:

- Can the Soviet Union meet its obligations to deliver increased volumes of natural gas to West European buyers beginning in the last quarter of 1984?

- Can the Soviet Union commission the Urengoy-to-Uzhgorod export pipeline in late 1984, thus flaunting its ability to carry through the project despite US sanctions?

- Can the Soviet Union complete the export pipeline with the planned array of equipment and meet designed performance goals by late 1984?

- How will the mobilization of resources to counteract the US sanctions affect the Soviet economy?

We believe that:

- The Soviets can meet schedules for gas delivery to Western Europe.

- The Soviets will be able to commission the export pipeline and start pumping gas through it, albeit not at the designed level of throughput, by late 1984.

- The Soviets will not be able to fully equip the export pipeline and bring it to full-bore operation by the end of 1984. But the impact of the US sanctions on this result is difficult to assess, because the usual delays in Soviet execution of major pipeline projects would probably have retarded full completion to 1986 even if the United States had not imposed sanctions.

- If the USSR is able to acquire Western compressor equipment, the effect of the US sanctions on the Soviet economy will be negligible. Should US sanctions force the Soviet Union to rely entirely on domestic compressor equipment, the USSR could lose roughly 30 BCM of gas production in the mid-1980s.

RANGE OF OPTIONS OPEN TO THE SOVIET UNION

Moscow has a range of options available to meet its gas delivery commitments to Western Europe under the contracts recently negotiated or still under negotiation.

- Alternative sources of equipment.--Moscow can try to convince Western suppliers to deliver the equipment now on order, equip the pipeline with Soviet turbine-compressors, or work out a combination of these options.

- Alternative types of equipment.--The Soviets can stick to their plan for powering compressor stations with gas turbines, turn to other power sources such as electric motors, or use different types of equipment on different parts of the pipeline.

- Use of other pipelines.--Moscow can try to supply all of the gas called for under the new contracts with West European purchasers through the export pipeline, use excess capacity in the existing gas transmission system, or supply some or all through other new pipelines in the rapidly expanding trunkline system carrying gas from the huge Urengoy field to the western USSR.

- Adjustment of gas delivery schedules.--West European gas requirements through 1987 are likely to fall well below the full volume specified in the contracts. Moscow therefore may be able to adjust the phasing-in of gas deliveries to some or all of the West European customers. [redacted] 25X1 Such adjustments would in turn permit the stretching out of equipment delivery and installation schedules.

DELIVERING THE GAS

The amount of gas to be delivered and the schedule for phasing-in the deliveries are obvious considerations in judging Moscow's ability to supply gas to its West European customers under the new contracts. At this time, both of these variables are still uncertain and must be estimated. The nominal maximum offtake specified in the contracts with West German (including West Berlin), French, and Austrian buyers totals 21 billion cubic meters (BCM) per year. Italy may sign for as much as 8 BCM per year, bringing the total delivery requirement close to the throughput capacity of the export pipeline when fully-powered--29 BCM after allowance for compressor station consumption of gas. But the contracts provide for periodic negotiation of the specific offtake, which may be set below the nominal maximum by agreed percentages. Thus, the Soviet obligation to deliver--if Italy

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signs—could be as high as 29 BCM per year or as low as 22 BCM per year. Without Italy, the obligation could range between 21 BCM per year and 15 BCM per year. Depending on West European gas demand in the late 1980s, therefore, equipment capacity to provide maximum throughput in the export pipeline may or may not be needed. Although we do not know the details of the West European gas purchase contracts, we believe that they provide for a gradual phasing-in of deliveries, with maximum volume to be available by 1987.

Moscow will most probably seek to meet its delivery commitments beginning in late 1984 by:

- Using existing pipeline capacity in the Soviet Union and Eastern Europe to export additional gas at an annual rate of up to 6 BCM beginning in late 1984.
- Delivering gas through the export pipeline at an annual rate of about 16 BCM beginning in late 1984 by acquiring turbines built in Western Europe incorporating the 20 or so GE-made rotor sets already in Europe.
- Adding turbines built with the 40 rotor sets contracted for by the Soviets from Alsthom-Atlantique in November 1981 to boost throughput on the export pipeline to about four-fifths of maximum (forgoing standby capacity) and, in conjunction with the use of excess capacity in other pipelines, be in a position to supply maximum contracted deliveries by 1987.
- Accelerating completion of the pipeline by supplementing available Western equipment with Soviet turbines and compressors diverted from construction of domestic pipelines.
- Alternatively, if it fails to engage West European cooperation in violating the spirit of the US sanctions, Moscow would rely on compressor equipment diverted from new domestic pipeline construction, and might even extend one of the large domestic pipelines to Uzhgorod.

Thus Moscow should be able to meet its obligation for initial deliveries of gas to Western Europe in late 1984 and supply full volume in 1987 if called upon to do so by the purchasers. Acquisition of the full array of Western equipment ordered for the export pipeline would, of course, permit more economical use of the invested capital. It would also obviate delays in the growth of domestic gas production and utilization that would occur if extensive use of Soviet-built compressor-station equipment is required for the export pipeline.

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COMMISSIONING THE EXPORT PIPELINE

Now that the export pipeline project has become an even more important political objective for the Soviets, we expect that they will install sufficient equipment to permit a symbolic commissioning of the pipeline in late 1984. Pipe is available, and pipelaying and testing should be completed before the last quarter of 1984. Although the pipeline might at that time be equipped with only a fraction of the compressor power originally ordered from Western suppliers and the elaborate central control system might not be operational, the pipeline could function. An essential consideration underlying this judgment is the non-linear relation between gas throughput and compressor power on large gas pipelines. For example, one third of planned compressor power on line will deliver about two-thirds of planned throughput.

A related factor affecting Soviet options is the considerable redundancy in compressor equipment ordered for the pipeline. When the Soviets originally planned the compressor stations for the export pipeline, they were contemplating construction of two strands of pipe. Each of the 40 line stations was designed, therefore, to accomodate 5 of the 25-megawatt (MW) GE Frame V gas turbines and associated compressor equipment. For the first strand of the export pipeline, (the one now under construction), three Frame V turbines were ordered for each station--2 to run on line and 1 as a standby unit. Later, should a second strand of pipe be laid, the standby unit would be available for use on either strand. Thus, of the 120 Frame V turbines on order for the one pipeline being built, 80 are for on-line operation and 40 are for standby. In the initial stages of operation, the Soviets might forgo having standby units in some compressor stations, thus making available for on-line operation a larger share of the available compressor equipment and raising the attainable throughput of the pipeline. We believe that Moscow will maintain standby units in some compressor stations--especially at the relatively inaccessible sites in West Siberia. The Soviets may also reduce the number of compressor stations to be constructed by 1984. Construction resources and equipment could be marshalled to ensure minimal operation of the pipeline by late 1984. Later, as additional equipment becomes available, the intermediate compressor stations could be added and desired standby units could be installed. A staged buildup of compressor stations and compressor-station equipment is feasible and is common practice on Western pipelines.

COMPLETING THE EXPORT PIPELINE

Discussion of 'delay' requires a benchmark from which to measure the delay. The West European turbine builders think in terms of their contractual delivery dates; the Soviets, in terms of the late 1984 date of planned completion--which has been given added prominence by Moscow's propaganda campaign since the imposition of the US sanctions. A more realistic benchmark for the full equipping of the pipeline with all planned equipment might be in 1986, the date we considered likely before the imposition of the US embargo. However, because of the political significance attached by the Soviets to the 1984 target, we adopt 1984 as the benchmark from which delay is to be measured in the following discussion.

The Soviets ordered the 120 Frame V turbines for delivery by the fall of 1983 to allow time for shipment to site, installation, and testing before the final quarter of 1984. Before the December 1981 embargo order, General Electric had shipped 20 or so Frame V rotor sets to its West European manufacturing associates which held orders to supply Frame V turbines for the Soviet export pipeline.

If the US embargo were to be lifted before the Soviets complete alternative plans for equipping the pipeline (and if--as is likely-- the Soviets agree to stretching out the equipment delivery schedule in order to obtain Frame V turbines with GE rotors), about 20 units could be shipped to the Soviet Union by early 1983, but the remainder of the order (about 100) would be delayed for about a year. General Electric would have to reschedule and resume production of the rotor sets. The delay to full completion of the pipeline would be about 1 year (to late 1985). In the interim, however, fulfillment of gas delivery contracts and operation of the export pipeline at less than full capacity would be possible.

If the US embargo continues past a point of no return at which the Soviets--possibly together with the West European equipment manufacturers--firmly adopt alternative plans for compressor-station design and equipment supply, delays to full completion of the pipeline could range up to 3 years (to late 1987). Nonetheless, the USSR could fulfill its gas delivery contracts and operate the export pipeline at less than full capacity.

IMPACT ON THE SOVIET ECONOMY

Any reduction in the availability of Western compressor equipment will have some impact on Soviet gas production because shortage of this equipment has been a major bottleneck in the gas industry. The diversion of Soviet-made equipment from installation in compressor stations on the domestic gas transmission system would increase the real cost of the export pipeline project to the Soviet economy and would decrease the reliability of the export pipeline. In the extreme case--denial of ~~any~~ all Western compressor equipment coupled with a crash Soviet effort on the export pipeline--the USSR could lose roughly 30 BCM of gas production in 1985 because of reduced compressor power on the new domestic transmission lines. The forgone production would represent about 5 percent of planned output of gas in 1985 and less than 2 percent of planned energy production. This shortfall may, however, overstate the effect on the Soviet economy because (a) the USSR is likely to obtain some Western compressor equipment by the means suggested above and (b) below-plan economic performance is curtailing growth in domestic energy demand.

Moscow clearly would prefer to avoid whatever disruption in domestic energy plans would result from diversion of equipment from domestic gas transmission to use of the export pipeline. Some of the increase in supply of Urengoy gas to the domestic economy is needed to offset declining gas availability from the older Ukraine and Caucasus gas fields. If necessary, however, the Soviets would accept the costs entailed in order to ensure the expected hard currency revenues from the new gas sales beginning in 1984. Facing a tight supply of energy in the mid-1980s, Moscow might be forced to reduce delivery of fuels to Eastern Europe more rapidly than it now deems politically feasible. It would also have to make internal adjustments in planned gas consumption that could:

- Curb efforts to substitute gas for oil and coal.
- Reduce industrial efficiency, especially in metals and petrochemicals.
- Intensify competition between sectors of the economy for scarce resources.

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Siberia-to-Western Europe Natural Gas Pipeline*

*Including provisional routes of transit lines through Czechoslovakia and Hungary to West Germany, Austria, and Italy.

The Pipeline at a Glance

Length: 4,650 kilometers (Urengoy-Uzhgorod)

Capacity: 35 billion m^3 per year (gross); 29 billion m^3 per year (net)

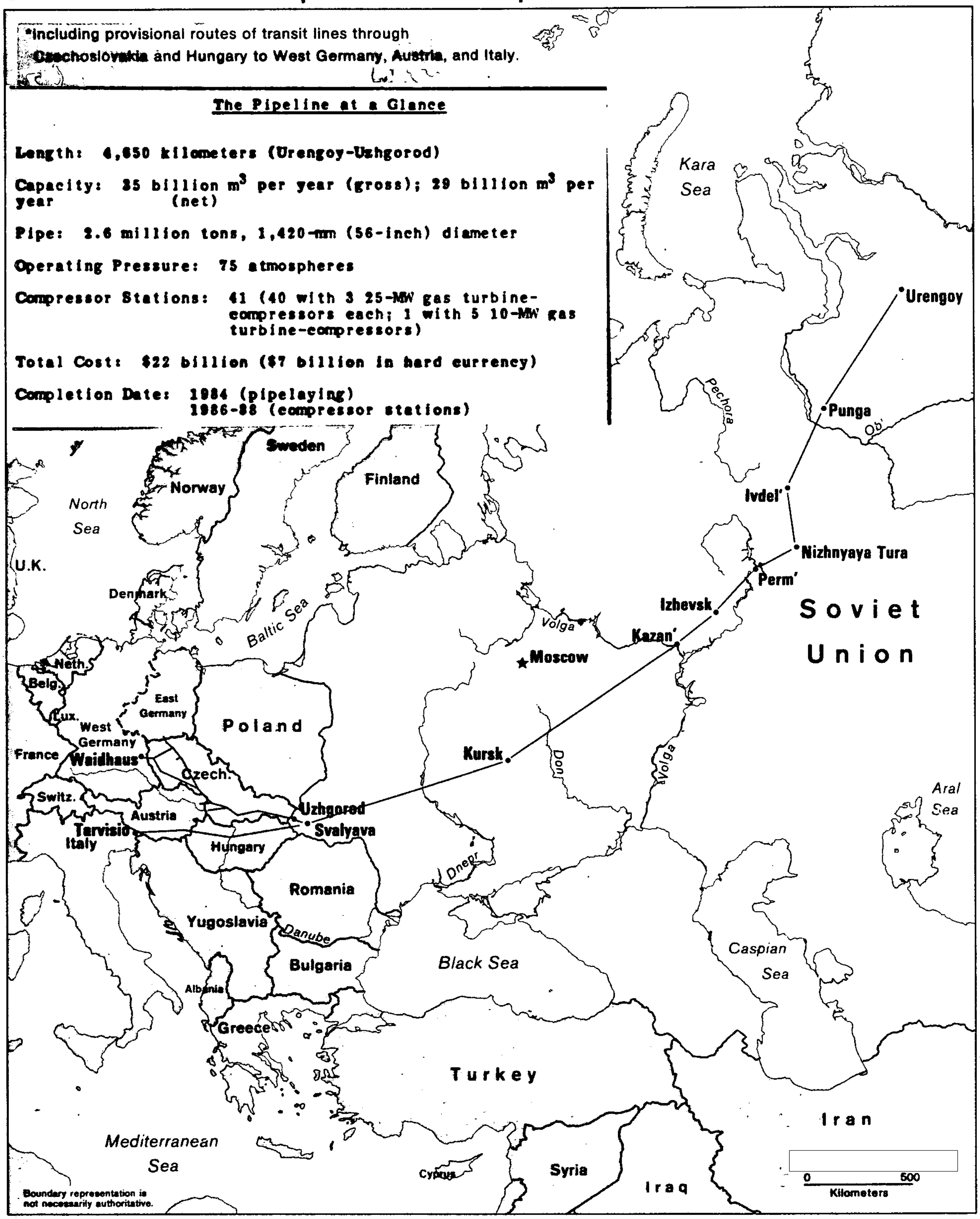
Pipe: 2.6 million tons, 1,420-mm (56-inch) diameter

Operating Pressure: 75 atmospheres

Compressor Stations: 41 (40 with 3 25-MW gas turbine-compressors each; 1 with 5 10-MW gas turbine-compressors)

Total Cost: $22 billion ($7 billion in hard currency)

Completion Date: 1984 (pipelaying)
1986-88 (compressor stations)



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